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GROWING

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A TREATISE ON
CORN CULTURE

FROM PLOWING AND PLANTING
TO HARVESTING AND
MARKETING

BY
E. S. TEAGARDEN

THE WESTERN PLOWMAN

MOLINE, ILL.

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Growing Corn Successfully.

A Treatise on Corn Culture, from Plowing and Planting to
Harvesting and Marketing.

By E. S. TEAGARDEN.

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PREPARING THE SOIL.



THE first work to be done is the preparation of the ground by plowing and subsoiling. The time is past when the important matter of subsoil plowing is to be neglected. Excessive and protracted drouths have taught the people

the vital lesson that *moisture must be stored up in the earth for the use of crops when needed.* And this can only be done by deep plowing and subsoiling; the deep plowing to be practiced each season, and the subsoil plowing occasionally.

Deep plowing is now generally admitted to be the only true way, but the depth of plowing is varied according to the depth of soil, and according to the ideas of the various farmers who write or speak on the subject.

The depth of soil should not determine the depth to plow; some soils are only two to three inches deep, while others are from two feet to ten feet deep. A shallow soil is made deeper by plowing deeper than the sod, as it is a well-known fact that earth brought to the surface from great depths will soon be converted into pro-

ductive soil by the action of the elements. Therefore deep plowing will deepen a thin soil to any desired depth. Where the soil is deep the plowing may be one foot or more, and the subsoil plow may go down ten inches deeper merely to loosen the subsoil. The great matter to be accomplished by deep plowing and subsoiling is to enable the soil to absorb the moisture of rains before time is given for evaporation, so that an abundant supply of moisture may always be present in the soil, and if this result is secured no great loss of crop will ever be met with in the most protracted drouth.

HARROWING THE FIELD.

The harrow should follow the plow so that no time will be given for clods to form or for the soil to dry out. This is a very important matter, and one that is much disregarded by farmers, to the great loss of crops and the increased labor required to cultivate, occasioned by the presence of clods and a dry soil made so for want of harrowing at the proper time.

The air performs a very important part in supplying the conditions of growth, and also in the production and supply of plant food in available forms for the growth of plants and the production of fruit. It is by the action of the air that the fertility

of the earth is made available, and unless the conditions are the most favorable the results will not be the most desirable.

While the soil is loose and mellow deep down the action of the air on the earth is the most effectual in the elaboration of plant food by the joint action of the air and earth. The object of cultivation is to supply the conditions of soil most favorable for the action of the air on the soil, and mellowness and moisture of soil are the essential conditions to be supplied by cultivation.

UNDER DRAINAGE.

Under drainage is essential where the soil is inclined to be wet, or as in many soils that are liable to be wet in a wet season.

Under drainage will prevent the loss of a crop in a wet season, and so the expense of draining will be met by a single good crop, and prevent the loss of crops in all the future. But if deep plowing and occasional subsoil plowing is practiced, drainage will not be required unless the land is inclined to be wet, or is liable to be too wet in a wet season.

Having the ground ready, the next step is planting the corn, but before the planting is done there must be the best seed secured, and one of the most important matters is the *variety*. Millions of farmers lose many millions of dollars by neglecting to use the best seed. And in this matter there is a very common mistake made in the selection of large ears.

SELECTION OF SEED.

It is supposed that large ears are necessarily late, and very generally this is true, but by a careful system of selection and breeding large ears can be produced that are as early as small ones.

But the only successful rule to adopt is for each farmer to choose the largest ears that will mature in the latitude.

A variety that has been developed to grow large and early ears with large and deep grains is the most profitable to grow for a crop.

There is a tendency with some farmers to oppose large cob corn, but a large cob must always contain large corn, and the larger the cob the greater will be the amount of corn, so that it is clearly seen that a large cob is no objection. Large cobs with large and deep grains will give

the greatest yield of crop, and this is just what every one wants, large ears and large yield of crop.

DEPTH FOR PLANTING.

If the soil has been properly prepared by deep plowing and subsoiling and thorough harrowing so that it is fine deep down, then the seed can be planted four to five inches deep, and it will be found that deep planting is of great advantage in times of drouth. A good average depth is about four inches and then every facility is given favorable to early germination that will prove favorable in times of drouth. Deep planting allows the roots to go down deep into the moist earth, where plant food is found to promote growth. The cultivator should be run through soon after planting, setting the shovels to throw the soil squarely both ways. As soon as this is done run the harrow over the ground until the surface is made level and fine.

USING THE CULTIVATOR.

If this work is well done, so that the surface is perfectly level and fine, the cultivation may be commenced as soon as the plants are fairly through the ground, so that the rows may be seen. The cultivation should be continued once each week, if possible, until the double cultivator cannot be used any longer, or until the *corn* is too high for the cultivator to be used, and even then, the single cultivator going between the rows may be used to advantage if dry weather sets in so as to dry out the soil, as moisture is kept up by keeping the soil well stirred, as mellowness of the surface soil will insure a continuous growth by supplying moisture during a dry time. Cultivation is all that can be done, and it is an effective remedy under all circumstances and conditions and is the only thing that man can do. *Till the soil* is the only work of man, and if he performs that well all else will be added and the very best results will follow.

SHALLOW CULTIVATION.

The great danger, or at least one of the dangers, is that the cultivation being left off for one week the roots will rise toward the surface and when the cultivation is done the roots will be destroyed and the growth of the crop greatly interfered with, so that not only frequent but shallow culti-

vation should always be given. It is difficult to see how any one could ever have supposed that cutting and mangling the roots of plants could by any possibility add to the growth and to the fruits or the plants. If all the roots were cut the plants would die at once and if one-half the roots are destroyed the plant is at once one-half dead, and if any portion of the roots are destroyed to that extent the life of the plant is interfered with.

If the roots are cut in a wet time they can start a new growth, but while this is being done and until it is fully accomplished there must of necessity be a check in the growth and a loss sustained by the plant, but if this root pruning is done in a dry time then the roots cut will perish for want of moisture, and often the corn plant is seen to wilt, and how can there be continuous growth of the plant? The old-fashioned philosophy of bygone days by which the farmers were about equally divided between root cutting and deep cultivation and shallow cultivation has given way to a more enlightened practice among nearly all farmers.

SUPPLYING PLANT FOOD.

The great need which is supplied by cultivation is the supply of moisture, and this is effectually done by keeping the soil mellow on the surface. A mellow surface of three inches in depth will hold the moisture rising by capillary action until it can be absorbed by the plants, and this is all that is needed, for with the moisture there will be the accompanying plant food. By frequent and shallow cultivation weeds are prevented from growing, moisture and plant food are supplied, and no more can be done by the cultivator, and no more is needed, as nature supplies all else and the greatest results may be expected if the cultivator supplies these conditions perfectly.

SOWING THE SEED.

All having been done that can be done by the cultivator and the crop no longer needing attention, the only thing left is to wait for the maturity of the crop, that seed sowing may be attended to, and the selection of the largest and best ears is the first consideration, but this last should not be done until the perfect maturity of the plants takes place. As soon as the stalk shows perfect ripeness the seed ought to be gathered, for then it is at its best.

It is a very common thing among farmers to complain of a "*poor stand*" of corn and it seems like a very mysterious matter to them, but it is quite easily accounted for in the fact, that as a general thing, the seed is not good.

It frequently happens that a rain occurs after the seed is ripe, and the corn gets wet, is softened, and then a cold blast from the north sets in and freezes the seed, and it is rendered worthless.

SELECTING THE SEED.

Again, it is often gathered just at the right time, and is hung up out-doors to dry, but rains come and then a freeze, and so much of the seed is frozen and spoiled; and still there is another cause of failure to grow, and that is it is placed where the first freeze strikes it, and all the ears that are not perfectly dry will freeze, and so the seed is ruined; that is, a portion in all of these cases being only partially dry becomes frozen and spoiled, and in this way a poor stand is had.

The great matter is to have the seed perfectly dry before it is exposed to freezing weather, and in order to do this it is best to gather the seed as soon as well matured, and hang up where it will dry and where it will not freeze.

If this simple rule is observed hundreds of millions of bushels would be gathered where now it is lost by a poor stand caused in some of the ways referred to.

"As ye sow so shall ye reap."

And if poor seed is sown a poor crop will be reaped; and there is no other way out of it. It would be thought that farmers should know how to sow seed after the world has stood about six thousand years: but the truth is, as is clearly seen from the millions of "*poor stands*," that there is a general neglect in this matter.

LARGE AND SMALL EARS.

By selection and care in growing, all the best improvements have been accomplished in the rearing of live stock, and by the application of the same principles to growing farm crops the same wonderful results may be accomplished.

It is true that large ears with deep grains may be developed that will be as early as small ears with shallow grains. If an increase of one ounce in the weight of the ears could be obtained by careful and judi-

cious selection, it would add many millions to the general crop, and would reduce the cost of the crop to a paying point.

The great object should be to get the most from a given area, and the only way to do this is to have the best and do the best at every step in the production of the crop. A high aim is apt to bring about the most desirable results.

HARVESTING THE CROP.

As soon as the corn is perfectly dry, but after maturity, it should be harvested and cribbed.

Corn left in the field is bound to deteriorate by exposure to rains and freezing, and should, therefore, be harvested as soon as it is ready.

It is believed that the very best way to treat the crop, and to get all the benefits from both grain and fodder, is to "*top and blade*" as soon as the fodder is ripe.

There are many and great advantages to be gained by this plan:

First—The value of the fodder so saved is many times greater than the value of the stalks after the corn is husked.

Second—The value of the fodder is much greater saved in this way than it would be if "cut up" in the usual way, as the following objections are always obviated by topping and blading:

First—By "cutting up" the heavy, large stocks, as they constitute more than one-half the weight and about the one-half of the bulk of the fodder without adding to the feeding value, for no stock should be allowed to feed on the stalk below the ear, as the hard, glassy substance is injurious to all kinds of live stock.

Second—By "cutting up" the labor of bundling the fodder, in hauling, stacking and feeding, is increased at least three-fold, without the least gain to the feeding value.

PREPARING FODDER.

The proper way, then, is to "*top and blade*" as soon as the fodder is matured—that is, as soon as it begins to turn yellow and the grains of the ears are fairly hardened.

The operation is very simple. A sharp knife in the hands of the operator, who must be of sufficient height to reach to the ears readily, when the knife is used to cut off the stalk just above the ear. Boys may be employed to strip off the blades below the ear, and as these constitute about one-

half of the fodder they ought always be saved.

The blades may be laid on top of the bundles of tops, as they are cut and thrown on the ground.

As soon as the fodder is partially dry it should be tied up in bundles and stacked in shocks of fair size, and tied up to prevent blowing down, and as soon as perfectly dried out it should be hauled and stacked or stored under shelter at convenient places, to be fed out to *milch cows* and other stock.

As much as possible should be fed in racks out doors, so that there will be no waste by the stock tramping on it, and if carefully fed nearly the whole amount—stalks and all—will be eaten up by the stock. If fed in mangers in the stable very little litter will be left.

CRIBBING THE CORN.

When the corn is harvested it should be "snapped" from the stalk and taken to an open shed near the crib, where it may be *husked at leisure*, saving the "rush," the "hurry-blurry" and usual haste in the operation of harvesting the corn crop. The husks ought to be stored and saved for feeding purposes, as they are very much relished by all live stock during the cold weather.

If the corn cribs and sheds were so arranged that the corn could be readily thrown into the cribs as it is husked, a great saving in time and labor would be effected.

FODDER AS A FOOD.

The great objection to the plan of saving the fodder consists in the fact that it is *supposed* to take a greater amount of time and labor than the "cutting up" process, but when it is considered that the handling is reduced more than one-half and the storage room reduced about one-half this objection is fully met and overcome. It resolves itself into the question, "Will fodder saved in this way pay?" To answer this we have only to consider the fact that no feed is more valuable for *milch cows* than fodder properly saved, and no labor is better rewarded than that expended in this way.

Hired help to do this work will be economy, if it is necessary to do so.

No feed except clover is nearly equal in feeding value, especially for *milch cows*,

as a milk and butter producer, to corn fodder properly saved in this way. The husks also possess a feeding value equal to hay or the best straw.

Clover being so very difficult to harvest in good condition is less valuable than corn fodder saved in the way referred to.

The great advantage gained in saving the fodder is in the fact that no extra ground is taken up to get this crop, while the clover or other hay crops must have extra ground to produce them.

The grain of the corn crop requires the ground to produce it and so the fodder saved is so much clear gain, which costs you nothing except the labor of harvesting and saving.

VENTILATION FOR CRIBS.

The general habit of making wide cribs is a very reprehensible one, as there is liable to be too little ventilation, resulting in the grain becoming musty and moldy. For feeding purposes the grain must be preserved in its original purity in order to possess full feeding value; and for purposes of use as a table product perfect purity is of the first importance, and very generally this is not had when the grain is kept in wide cribs, which do not admit the air.

Cribs should also be made vermin proof—that is, rats and mice should be excluded entirely. Although this is not generally considered, yet it is a matter of great importance. Aside from the destruction of the grain the filth caused by the presence of rats and mice is absolutely unbearable.

Corn rendered filthy in the extreme in that way is taken to the mills and ground through and placed in sacks and barrels to be consumed by the people who generally do not have the chance to know the amount of filth and poison put upon the table to be consumed by the family. This is a grievous sin, to be punished by the "judges," and ought to be remedied by the farmers, who alone have it in hand.

SEED DEVELOPMENT.

Surely farmers should make some effort to make an improvement in the seed of so valuable a crop as the corn crop. No one consideration relating to the successful production of the corn crop bears so important a relation thereto as the improvement of seed.

No man can stand in opposition to this and succeed for a moment. Its importance is everywhere acknowledged. Then why should not farmers avail themselves of the great benefits of this great advantage?

Does not every one know that seed grown in the ordinary way is no better than the general crop which has been grown for ordinary purposes?

How can the seed possess extra qualities when no extra means has been used to give it more than ordinary advantages?

Growing the seed in hills with two or three stalks in a hill cannot result in any great improvement, even if all other advantages are given.

How can it be expected that seed having one or two of its greatest enemies growing near to it can grow to the greatest perfection?

Suppose one or two large weeds were allowed to grow in the hill where one stalk of corn is grown. Could it be expected that the stalk would attain to as great perfection as when grown by itself? If, then, allowing weeds or other stalks to grow in the same hill along with the stalk that is to produce the seed prevents that stalk from doing its best, does not this settle the question forever that the true way to produce seed is to grow the seed stalks separated from each other at such a distance that each may do its best to produce the best growth and the most perfect fruit?

PREPARING THE SOIL.

Having found that to grow the seed stalks by themselves will produce the most perfect seed, how far apart ought the stalks to be grown?

Doubtless the rule should be to give as great a distance between single stalks as possible so as to permit perfect fertilization—say from two to three feet apart in the hills or between single stalks—and the usual distance between rows, or, say two feet between single stalks and the rows four feet apart—this distance between rows will admit of cultivation after the stalks have attained full growth.

It is important that the cultivation shall be kept up until the grain begins to harden, as it is an important fact to be ever borne in mind that moisture is needed as long as there is growth either of stalk

or of grain, and that moisture is supplied by keeping the surface mellow by cultivation.

This great width between rows will allow the use of a single cultivator long after the double cultivator is laid aside, and the blades will not be broken near so much as when the rows are narrow.

SOME TIMELY HINTS.

In growing the best seed several things must be observed :

First—The best portion of ground must be taken—that is, that portion best suited to growing corn.

Second—The best seed must be used.

Third—The best preparation possible to make must be given to that portion that is to produce the seed.

Fourth—The best culture and care throughout must be given to that portion that is to make the seed for the succeeding season's crop.

First, then, as to that portion of ground that is to be used to grow the seed. It must be plowed deep and with narrow furrows so as to break up and fine the soil thoroughly, and if possible it should be subsoil plowed to simply loosen the subsoil, not throwing it out. After this the harrowing should be done so completely that the entire surface will be made perfectly fine, and the harrow should run as deep down as possible so that the soil will be as fine as possible as deep down as it can be done.

SUPPLYING FERTILIZERS.

The importance of this work is seen in the fact that the roots of plants need to penetrate the soil to a good depth that moisture may be constantly supplied to the roots of growing plants. This portion of the ground should be thoroughly manured, or well fertilized with the best commercial fertilizers, so that the growth may be the very best that can be produced.

The very small portion of ground required to grow the seed needed will not require much time, labor or expense in its preparation, and therefore no excuse may be offered for neglecting this important and indispensable work.

If the very best conditions are supplied there will be such a decided improvement in favor of good seed that a marked improvement will be seen both in the yield

and quality of the general crop grown from the seed the succeeding season.

SELECTING THE BEST SEED.

The selection of the seed is the next step in the program of seed improvement.

Of course every one will say that the very best seed should be used, but how will this "very best seed" be obtained?

We can only say that the best that can be done is to select the best from the seed to be used for the general crop.

The largest ear with largest and deepest grains will make the best selection, but unless that selection is made from seed of a variety that grows large ears with large and deep grains, then it would be advisable to look elsewhere for such a selection, for the cost of obtaining a small amount of seed to grow the seed needed for the next season's crop will be a trifling sum as compared with the advantages of using the very best seed.

PLANTING

Should be done as early as the ground is warm enough to start the seed into growth in order to give the longest time for the growth and maturity of the crop before there is any danger of frost. If the soil has been properly plowed and harrowed the seed may be planted from three to five inches. Clay soil will require that the seed be planted a less depth than in a deep black soil. If the soil is light and porous the depth may be much greater than in a solid, compact soil.

The deeper the grain can be planted to insure quick germination the better will it be for the crop, and especially is this true if a drouth should occur, that will require all the moisture in the soil to be used, as every facility should be afforded for the roots to reach down below the drying out point, and to this end deep planting and deep plowing and subsoiling are the only source of reliance.

CULTIVATE OFTEN.

Having planted the seed properly and given the proper width between rows, say about four feet, and the proper distance between hills, about two feet, the next step is to run the cultivator so as to throw the soil about evenly to and from the rows and then harrowing immediately until the soil is perfectly leveled and fined so that the cultivation may be commenced

as soon as the stalks are fairly through the soil and the rows can be seen.

The cultivation must be continued at least once a week, and twice would be far better so that every facility will be afforded for rapid and healthy growth. The first cultivations, when the plants are small, may be close to the plants, but after the growth has attained to the height of eight to ten inches the cultivator should not go so close, but at all times it may be shallow, so as to not disturb the plant's growth by cutting the roots. If the cultivation can be given twice each week and if it is kept up until the grain begins to harden there will be given the very best opportunity for the most perfect growth, other conditions being equal, and the greatest results may be looked for in the way of greatly improved seed.

SAVING THE SEED.

As soon as the stalk is perfectly matured and dried out so that no more moisture can be drawn from it the seed should be gathered and if there is danger of freezing weather the seed should be gathered sooner and placed where it will dry out perfectly. And as soon as entirely dry it should be shelled, as a damp spell is liable to dampen the cob and greatly injure the seed, and in fact in this way seed is often entirely destroyed by freezing after dampness has collected through the cob and is diffused through the grain.

Dampness, heat and freezing must be avoided if perfect seed is desired. As the results of the entire crop are made dependent upon good seed, every possible care should be observed at every step of production and caring for the seed.

But those who will not take the little time needed to attend to this important work of producing the best seed may greatly improve seed by following rules requiring less trouble.

HINTS ON SELECTION.

First—Use the best seed at hand.

Second—Choose the best portion of ground.

Third—Prepare this in the best manner, and

Fourth—Plant this portion with the best seed. And if planted in hills thin out to one stalk in a hill when the plants are six inches high. Cultivate this when the rest of the field is cultivated and give it any

extra attention that may be practicable. Even these simple rules observed will give an improvement that will have a decided influence on the yield and quality of the general crop; and who would not depart out of the "old rut" far enough to try this simple manner of growing the seed for the crop that is the most valuable of any grown on the farm?

How much better it would be for all farmers if they would determine to pursue an intelligent course calculated to improve the seed and to increase the yield of crops.

IMPROVEMENT THE ORDER.

Every other industry is on the stretch to make improvement—every possible avenue is occupied and used for the promotion and advancement of all the industries of the nation, while it is lamentably true that agriculture, the most important of all, and which, in fact, embraces all of the value and importance of every other industry, because all are based upon it, yet it still languishes and lurks behind in the procession that is hurrying forward in the race of progress and improvement.

It is a fact of great significance and one which ought to awaken the keenest interest on the subject, that the average yield of corn is now and has been for over twenty years reduced far below a paying point, and while this is true a still more alarming truth is brought out, namely, that the soil everywhere is becoming depleted of its fertility.

The yield of corn as the average throughout the entire country is only 24 bushels per acre, as reported by the latest United States census, while those below the average have been realizing far less than the cost of production.

What can be the real cause of such a disastrous state of things? Can it be that the proper course has been pursued in agricultural work?

Certainly no person will assert that right methods have been practiced—it cannot be that such results are the fruits of a right system—and if this is so what may be the true cause of these failures?

Seed development has been sadly neglected. Reliance has been placed on seed grown in the ordinary crop. No effort has been put forth to improve seed, and of course no improvement has resulted.

WHAT TO WORK FOR.

What could be expected in the live-stock department had the same course of conduct been pursued as has been practiced in farm crops?

Who does not know that the wonderful improvements that have been made in live-stock have been accomplished by a strict compliance with the laws established in nature, that the selection of the best from "start to finish" and great care in bearing has brought these grand and beneficent results that are everywhere seen in all the departments of live-stock.

Why should farmers expect the best crops from seed that has had no attention above that given to the ordinary crop, growing in hills with two to three and as high as four and five stalks? It is utterly impossible for each of these stalks to do as well as one stalk growing by itself. It stands to reason that no improvement can be made on the yield and quality of the general crop if no improvement is made on the seed that is to produce the crop.

The importance of the subject of seed improvement cannot be dwelt upon too much. It is hoped, therefore, that farmers will awake to the importance of this great subject.

And next to this, or, rather, first and above this, is the very important matter of the best preparation of the soil by deep plowing each season and subsoil plowing occasionally. Perhaps the subsoil plowing need not be done oftener than once every ten years.

TO STORE MOISTURE.

The great matter is to keep the soil sufficiently mellow deep down that the rains will be quickly absorbed and carried down into the earth, where it is safely stored for the use of the crop, when needed, from whence it is drawn by the capillary action of the earth. If the soil is not mellow of sufficient depth to take in the moisture of rains as fast as they come the greater part is lost by the evaporating influence of the sun and air, and this is the secret of "depleted soils" throughout the country.

Shallow plowing for successive seasons packs the subsoil, making it so hard that the moisture of rains and melting snows will not swiftly run down, and so the moisture is taken away by evaporation

and is so lost to the soil and to the crop. Nothing is more important than the storage of moisture in the earth, to be used when needed by the growing plants.

It is a complaint well nigh universal that the soil is bereft of its fertility by producing grain crops for about twenty years in the great western prairie states where the soil is from to six and even ten feet deep, and in one-half the time in the regions where the clay soil is only about four to six inches deep.

RECLAIMING "DEPLETED" SOILS.

Why should this result follow? Why should the soil become poor by producing a poor crop? Is it an unavoidable result? Is it reasonable to conclude the Creator has so scantily supplied the earth with fertility that there is not enough to sustain vegetation?

Is it now rather certain that unbounded stores of fertility are deposited in the earth and in the air, and that if right methods are practiced so that the fertility supplied may be made available that the greatest results will follow in the production of the fruits of the earth?

Two important conditions are requisite in the production of crops and in obtaining the best results.

First—Mellowing of the soil and subsoil to the depth practicable by plowing and subsoiling, and

Second—Moisture must exist in the soil and subsoil so that the plant food produced by the action of the air on the earth may be made available.

That is if the soil is mellow deep down, then moisture will exist and the mellow condition of the soil and subsoil will favor the action of the air in the transformation of the elements of fertility both in the air and in the earth into forms available for plant growth, and this is the real secret of all successful agriculture, and without these necessary and indispensable conditions all may expect depletion of soils, loss of fertility, low yields of crops and general barren results throughout.

The simplest truth in agriculture, as in everything else, is of vital importance, and the simplicity hides it from self-asserted wisdom.

AN ABSURD POSITION.

This vastly important principle in agriculture is everywhere overlooked, and, in-

deed, it is *denied* even by some, the general belief and teachings of those who write on agriculture being the very reverse of those herein set forth. It is advocated that the grain or other products of the soil must be fed to stock and the fertility contained in these products must be returned to the soil, from which it is *supposed* it has been taken, in order to preserve the fertility of the soil. But if this be true of one farm it must be true of all the lands in cultivation, and if this course is pursued then the world will perish for want of food, and from this conclusion there is no escape, for it is infallibly certain this result must follow, there is no alternative.

This extraordinary position is taken by the agricultural writers of the past and present times and seems to be the one thing always brought to the front, and it has been not only advocated but attempts have been made to defend it, but as is absolutely unavoidable the result of such attempts have always been manifest failures, for if the world cannot have bread without the depletion of the soil then it is most certain that either the world must starve or else the soil must be depleted, and so in this event the world must finally perish for want of bread, for when the soil becomes so depleted that crops cannot be grown then there will be no bread, and the "bread is the life," and therefore there can be no life.

This system is "lame in both legs" — "the bed is shorter than a man can stretch himself upon, and the covering narrower than he can wrap himself in."

It is strange that men of good sense on other topics will so depart from the path of reason and right as to advocate a theory at once so fallacious, so injurious and so radically erroneous. The supply of air and water is inexhaustible and it is not unreasonable to believe that the essential causes of production are also unlimited in their supply. There need be no new creation of fertility, and there has been no demand for it and will be none if right conditions of soil are supplied by true cultivation.

AIR A FERTILIZER.

The air, being as it is, a great storehouse of fertility, and the earth, being supplied as it is, with unbounded supplies of the elements of fertility, and the two, the

earth and the air, acting conjointly in the elaboration of fertility for the food of plants, there can be no luck where the proper conditions are fulfilled by the tiller of the *ground*.

Shallow culture of the soil, that is, shallow plowing, will not afford the conditions necessary for the production of crops and keep up the fertility of the soil. By shallow plowing the soil on the top is exhausted of its fertility in a few seasons of grain cropping. Shallow plowing does not supply the conditions for the absorption of rains and so the moisture is carried off by evaporation.

The top soil soon becoming exhausted of fertility and the depth of the soil not being increased, as it is not by shallow plowing, there is no possible way by which good yields of crops can be produced. The great desideratum being to force from the soil the largest returns in the farm crops there must be the conditions supplied which nature's laws demand, and in the absence of this no great results may be expected, while the soil will always be less productive each season, a result most damaging in the extreme.

POSSIBILITIES OF INCREASE.

If by proper cultivation the soil is made capable of producing double the average yield, which is but 24 bushels per acre, there will be an increase of 26 bushels per acre, and this increase on ten acres will give 360 bu. clear increase over that of the average yield now obtained, and on 40 acres one thousand and forty (1,040) bushels of an increase, and on 100 acres will be had twenty-six hundred (2,600) bushels as a clear increased yield. And as the cultivation is little greater than when poorly done nearly all of the increase in crop is so much clear profit, and so the cultivator is many times rewarded for the extra labor and care.

Suppose that this increased yield is obtained throughout the entire country wherever corn is grown, what a vast increase in wealth would we have in comparison with the low yield of the corn crop as now obtained.

But we have only given one-half of what might be had provided the best conditions were supplied. One hundred bushels per acre might be grown, as is clearly proven by yields obtained under the stimulating

influences of large prizes which have heretofore been offered — frequently 150 bushels per acre has been grown, so that if we make allowance for variations in soils throughout the country we shall have as the average yield throughout the acknowledged “corn belt” at least 100 bushels per acre, and this increased yield per acre will give over the average of 24 bushels now grown 76 bushels per acre increased yield, and on 10 acres 776 bushels; on 40 acres an increased yield of *three thousand and forty bushels*, and on 100 acres *seven thousand six hundred bushels*.

This demonstrates that it would pay to cultivate right, to plow and subsoil to cultivate and develop the seed so as to obtain these great advantages.

DISCARD THE OLD METHOD.

It is proof incontrovertible that we do not use right methods in the cultivation of the ground when we get such miserable returns as twenty-four bushels per acre of corn.

Why should farmers on whose shoulders is placed the great burden of feeding, clothing and supporting the world fall behind in the advancement and progress which so grandly marks the period we are now living in, when it is known that they hold in their own hands the destinies of the grand work in which they are engaged? Why should the good farmers fall behind in the great procession in their onward march? Perhaps the answer to this is found in the fact that farmers attempt the cultivation of too many acres—too large an area—more than can be properly covered.

In the early settlement of the country lands were cheap, and every one purchasing lands aimed to get as much as possible, and so it has turned out that this policy, instead of proving beneficial, has resulted not only disadvantageously, but disastrously, as the sequel will show. Having a larger area under cultivation than could be properly attended, the result has been low, and constantly lowering yields of the corn crop, with a necessary and continued depletion of fertility of soil, which is everywhere complained of. Instead, therefore, of this out-reaching policy to obtain a large number of acres proving a good policy, it has turned out that one-half of the lands would have produced the same results had right methods been

employed, and this would have saved the original investment, all of the interest on land, the expense of keeping up repairs, taxes and the labor required to plow, cultivate and attend.

INTENSIVE VS. EXTENSIVE.

And if farmers would get into grass about one-half the land they are now attempting to cultivate, or would sell off one-half and put the remaining half under complete cultivation, so that just as much should be produced as is now obtained from the whole amount, they would then see clearly to what extent they would be gainers. The more that can be produced from a given amount of land the greater will be the clearer profit, and in this consists the true principles of all agricultural work.

When we undertake to carry too great a load—too much of a burden—we must fail, and, consequently, are worse off than we would be if we had attempted only that which we could have carried through with success.

So it is in the matter of growing too many acres of corn with a given amount of force to carry on the work, the result must be that a meager yield of crop will be grown, and, of course, depletion of soil always follows insufficient cultivation.

It is a rule, well established, that producing the best yields the soil is uniformly improved, and the reason is obvious, for it is by good cultivation that the best crops are produced. And it is by good cultivation that the fertility of the soil is brought out and made available. And so it is strictly true that the production of the largest yields of crops is invariably accompanied with increased fertility. And although it is by this grand truth that a great many persons are wonderfully “net-tled,” yet it is self-evident that if the best cultivation is given the best crops will be grown. And it is as self-evident that it is by the best cultivation that the fertility of the soil is improved. And although the proposition seems to strike some persons quite unfavorably, yet it is in exact harmony with known practical results. For example, it is known that the best farmers always raise the best crops, and it is as well known that such farmers always have the best farms, their lands are the richest, and they *always* grow the best crops.

ECONOMICAL FARMING.

If, then, it is true, as has been seen, that by good culture crops can be more than doubled, it would be good economy to greatly lessen the cultivated area and improve the methods of culture, so reducing the cost of production to the lowest figures possible and thereby enhancing the clear profits of the farm. These principles apply with equal force to all farm crops as well as to the corn crop, and should have a general *practical* application.

To present in a condensed form all of the foregoing conclusions, as well as the premises upon which they are based, will be the work of the remaining pages of this work.

It has only been a few years since no one advocated deep plowing—it was a very unpopular doctrine—and the one who advocated it was looked upon as somewhat “cranky,” a good deal “off his base.”

Some few years since a long discussion of the question of deep plowing was conducted in the columns of THE WESTERN FLOWMAN, and only one person advocated deep plowing and subsoil plowing; but since that time many have been convinced that the only course that can be pursued to remedy existing evils as relates to depletion of soils and low yields of crops, is the adoption of deep plowing each season, and occasional subsoil plowing. As proof of the great change that has taken place, it is known that there are now three manufacturing establishments that are putting out subsoil plows on sale to be used the coming season. And it is further known that successful experiments have been made and reported as to the relative results of subsoil plowing as compared with ordinary plowing.

RETAINING THE MOISTURE.

The evidence in favor of subsoil plowing resulting from these experiments is abundant and overwhelming, establishing its utility beyond the possibility of a doubt.

It is encouraging to note these changes in public sentiment regarding this very important matter.

As has been wisely said, moisture is the most important element in the production of crops, as by water all the elements of fertility are carried to the fine roots of plants, and by the absorption of water the accompanying fertility is also taken up.

To consume the moisture of rain is the great work of agriculture, and this is done by preparing the soil to absorb moisture before it evaporates. Storing it deep down in the earth to be brought up again for the use of plants by the capillary action of the earth, to enable the soil to readily absorb all moisture it is necessary that it be mellowed deep down by deep plowing each season, and subsoil plowing occasionally.

To store the moisture is just like cribbing at least one-half of a good crop of corn, because if a supply of moisture is always had the yield of crop will be at least double what it would be if only common plowing is done, and common cultivation given. The greater the depth of cultivation the greater will be the amount of moisture that will follow.

OLD FOGYISMS WON'T DO,

But cultivation after plowing is as important in its relation to good crops as proper plowing.

The cultivation must be so frequent that the soil will hold its moisture during the entire season of crop growth; for unless this is the case the yield of crop must be cut short.

The cultivation must be shallow so as to not destroy the roots of the plants, for certainly it is not a good plan to cut off the roots which feed the plants; that old fashioned and old fogy way will not do in this advanced age.

The progressive farmer has got away from that “old rut” habit.

The cultivation must continue until the maturity of the grain, for if it is suspended sooner and the soil on the surface dries out the crop will fail of making the yield it otherwise would do. Usually the corn crop gets less than one-half the amount of cultivation that it would pay to give it. Generally three or four cultivations is all that is given, and it is very evident that this is only one-half as much as should be given. One each week from planting until the maturity of the grain is little enough. The crop requires cultivation at least once each week from the beginning. But it is objected that time cannot be given to cultivate each week the entire crop, yet there is where the “trouble begins.” There are too many acres in corn; the ground can only be half plowed, half cultivated, and the

result is a *half crop*, while if one-half the ground, or less, was put in corn and the work done in the best manner "from start to finish," there would be as much corn harvested, and of a great deal better quality, while the entire expense of owning, working, keeping in repair, fencing and taxes would be a clear saving. Thorough work on the smallest area is the road to success in this as in every other department of human enterprise.

DOUBLE YOUR CORN CROPS.

Do well whatever is attempted and best results will always follow, whether it is growing corn for the general crop, or for seed, or any other work to be done on the farm, whether in connection with growing crops or raising stock, or in any other of the many departments of farm work.

If it is true that the proper cultivation of the *ground* will produce double as much crop as is produced by slack culture, which results in depletion of soil and loss of crops, then the gain will bring great success where failure is now the dismal result.

Better methods, better work all around and better results of a better life should be the great aim of all who are engaged in the great calling of agriculture.

The first great work to the lot of man was to "dress the garden and keep it." The second work was to "till the *ground*." The first work was allotted to man before he transgressed; the second work was laid out after transgression, and that work must continue until the "*restitution*," when man will be returned to the first work—that is, the earth will then "*yield her increase*" and the "*tree of the fields shall yield her fruit*," and then all that man will have to do is to "*dress and keep it*."

WORK ON BUSINESS PRINCIPLES.

Seed development along this line is an important work not to be lost sight of for any consideration, as it lies at the very bottom of successful corn production and never can fail to bring success whenever and wherever practiced.

It is in strict harmony with the principles of progress by which the world is being constantly revolutionized in all departments of human enterprise.

How in the name of reason do farmers expect to keep up with the advancing col-

umns of civilization unless they apply the same principles to their calling that are adopted and followed by other departments of industrial progress? When it is seen that any improvement in the seed will unavoidably have an influence over the general crop to increase the quantity and improve the quality it is in harmony with every principle of economy to adopt such measures as will insure the desired result, especially when it is seen that so little labor is required to accomplish the most desirable results. It is certainly a very great departure from true economy to neglect this essential particular.

Surely the time has come when every farmer will try to make some improvement in the seed and in the yield and quality of the general crop. Unless farmers get out of the "old ruts" they will continue to be valued in accord with the estimate they themselves place upon these important principles of agriculture.

DEPLETION OF THE SOIL.

Will not farmers be persuaded by their own interests and by the welfare of the world which is dependent upon them for food, to break away from the practices that have held them in bondage for ages past?

The sooner the cultivators of the *ground* adopt intelligent methods of seed development and similar methods in general farm work the sooner will be arrested this fatal tendency to *soil depletion*, everywhere felt, and the sooner will the yield of the corn crop equal the demands of natural laws.

Something *must* be done *soon* or the average farmer will starve to death.

The average of corn, and, in fact, all farm crops, for the past twenty years has been below the paying point and shows a constant tendency downward, which will, if not arrested, engulf the average farmer and those below him in bankruptcy and ruin.

Seed development, deep plowing each season, with occasional subsoil plowing, thorough and careful cultivation, saving all the manure, judiciously and properly applying it, together with all other helps and useful appliances and methods, must be resorted to and practiced by farmers in order to arrest the universal tendency

to depleted soils, low average of crops and general loss throughout the entire range of farm enterprise.

How few farmers are living in that independent way in which it is their right and duty to live?

THOROUGH WORK DEMANDED.

If farmers attempt the practice of economy in two particulars only a great gain would be made.

First—Lessening the amount of land in cultivation, so saving the cost of the land, interest, taxes, repairs, and the time and labor to cultivate.

Second—Increasing the productive capacity of that which is cultivated, so that the same amount of products is had from the lessened area as formerly from the whole amount. This course would result in greater independence, greater leisure and enjoyment, and much greater profit.

It is wonderful to what extent lands may be improved in productive capacity. It is known that near the large cities land rents for an annual rental of \$100 per acre.

How is it possible to improve the fertility so as to develop such marvelous results?

It can only be said that deep plowing and subsoiling, and, where needed, under draining, together with the best care and culture, including liberal fertilization, according to the circumstances surrounding, care in allowing the soil to dry out after rains, so that the ground is not worked when wet, is one of the ways to care for land. Many persons cut short the fertility of the land by plowing and cultivating when wet. This is very injurious, and one such injury to the soil will show bad results for at least a few years.

EXTERMINATE THE WEEDS.

Allowing stock to tramp over the ground after crops are removed, and when the ground is soft, is a very injurious thing, and ought never be practiced by farmers.

Too great care cannot be taken in these matters. And last but not least, great care should be observed in preventing weeds from growing in the corn field.

The cultivation must be such as to prevent weeds from growing; for weeds readily start into growth and consume moisture and plant food, and loss to that extent will ensue; but if the

cultivation is so frequent as to prevent growth, then loss cannot take place, and the crop will grow and mature perfectly.

If the ground has been allowed to go to weeds, then there will have to be extra exertions put forth to keep down weeds, and generally there will be a growth of weeds after the corn is "laid by," and for this reason, as well as other very important ones heretofore pointed out, the cultivation should be continued until the maturity of the grain.

But if after the crop is laid by weeds spring up and grow, it would be advisable to hire help, if necessary, to destroy them while very young, so that none go to seed to fill up the land and infest it another season. It requires much less labor to exterminate fully the first crop of weeds than it does to fight them the succeeding season, and all seasons in the future. In fact, the only way to get clear of them is to make clean work the first season and allow none to go to seed.

SOME CLOSING HINTS.

Millions of bushels of corn have been lost, and are lost, every season by the presence of weeds. It is impossible to grow a good crop of corn and at the same time a good crop of weeds. It is doubtless true that the best economy would destroy all weeds the first season, and if all farmers would unite they could overcome the weeds to a very great extent.

Nothing would pay better than for each neighborhood to make a special agreement among themselves to destroy all weeds, not only in the fields and pastures, but along the roadside, and in every "nook and corner."

Probably one-half the labor expended in the destruction of weeds each season could be saved if a proper effort should be put forth by a united community, besides the saving of the great loss of crop yields.

The great object is to prevent the seed from maturing, and if this is done the certainty of their extermination is assured. One weed stalk will mature seed enough to sow two or three acres, which will require one hundred times as much labor to keep down as would have been required to destroy that one stalk.

If the presence of weeds in the growing corn should cut off the yield five bushels

per acre, this would make a loss of two hundred bushels on forty acres, and this would pay for the total destruction of weeds on that forty acres for five years. And if this is true it is seen that the most successful way would be to determine upon a tour of extermination.

This once decided the work will be short and decisive, accomplishing the desired result.

Nothing would be more attractive to the eye and sense of the passerby than to witness the fields, the meadows, the roadsides, the fence rows, and "all and singular" of the entire farm entirely free from weeds and their destructive work.

IMPROVE THE HOME.

Every farmer should aim to make his farm, his dwelling and all his surroundings in such condition that all who pass that way will say, "*I would like to live there.*"

This would make the country a "Garden of Eden." This would convert the country into a paradise, almost, and would raise the farmers and their families to the

"highest niche of honor;" it would place them where they are entitled to stand by their sacred, important calling, and this high honor can be achieved by every one who will give the subject that attention which its great importance demands.

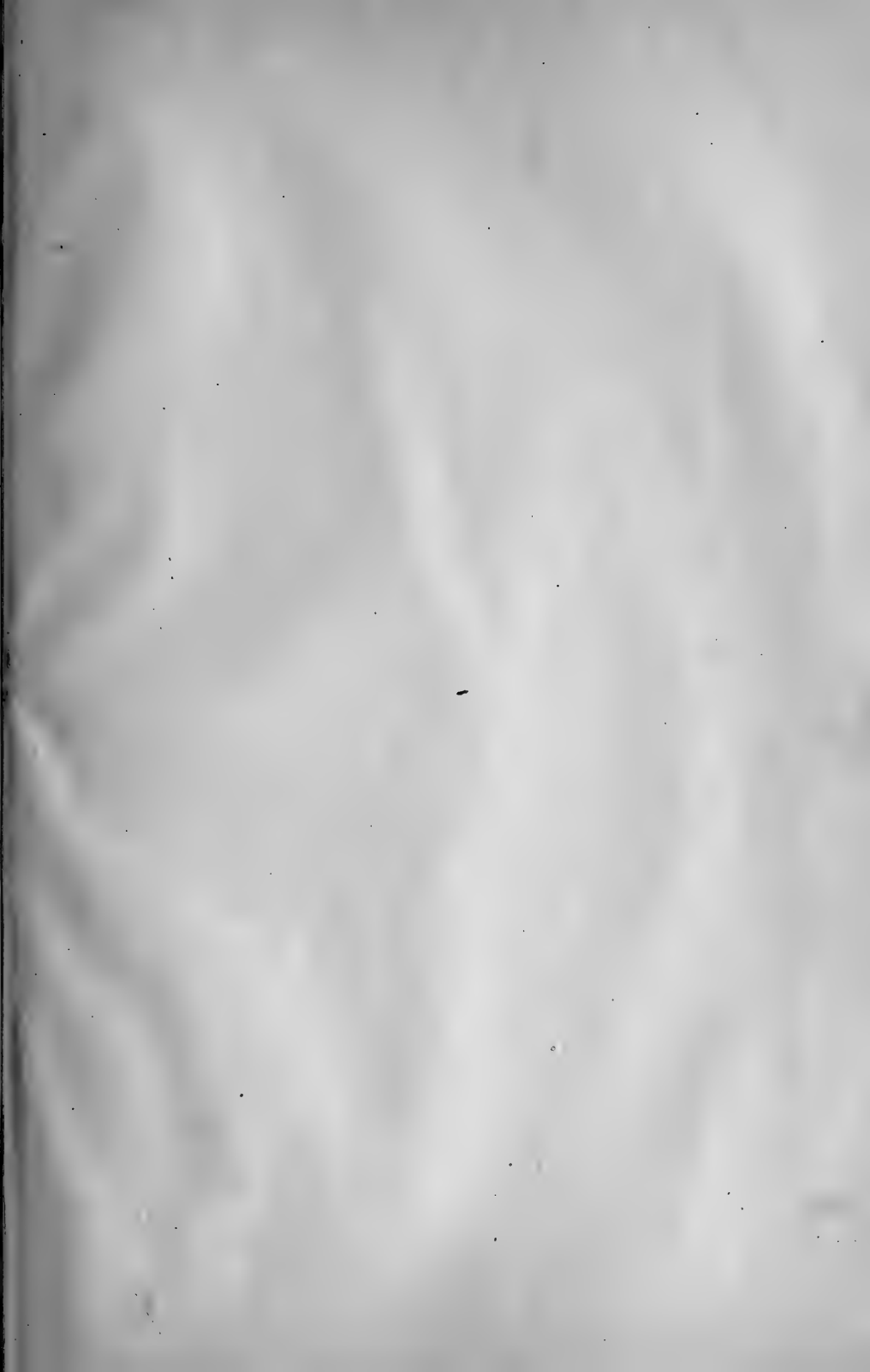
To be able to grow 100 bushels of corn per acre will enable every farmer to place his farm and everything belonging to it in that condition that will carry him and his family to the "front" with "*highest honors,*" and with satisfaction, contentment, happiness, prosperity and wealth,

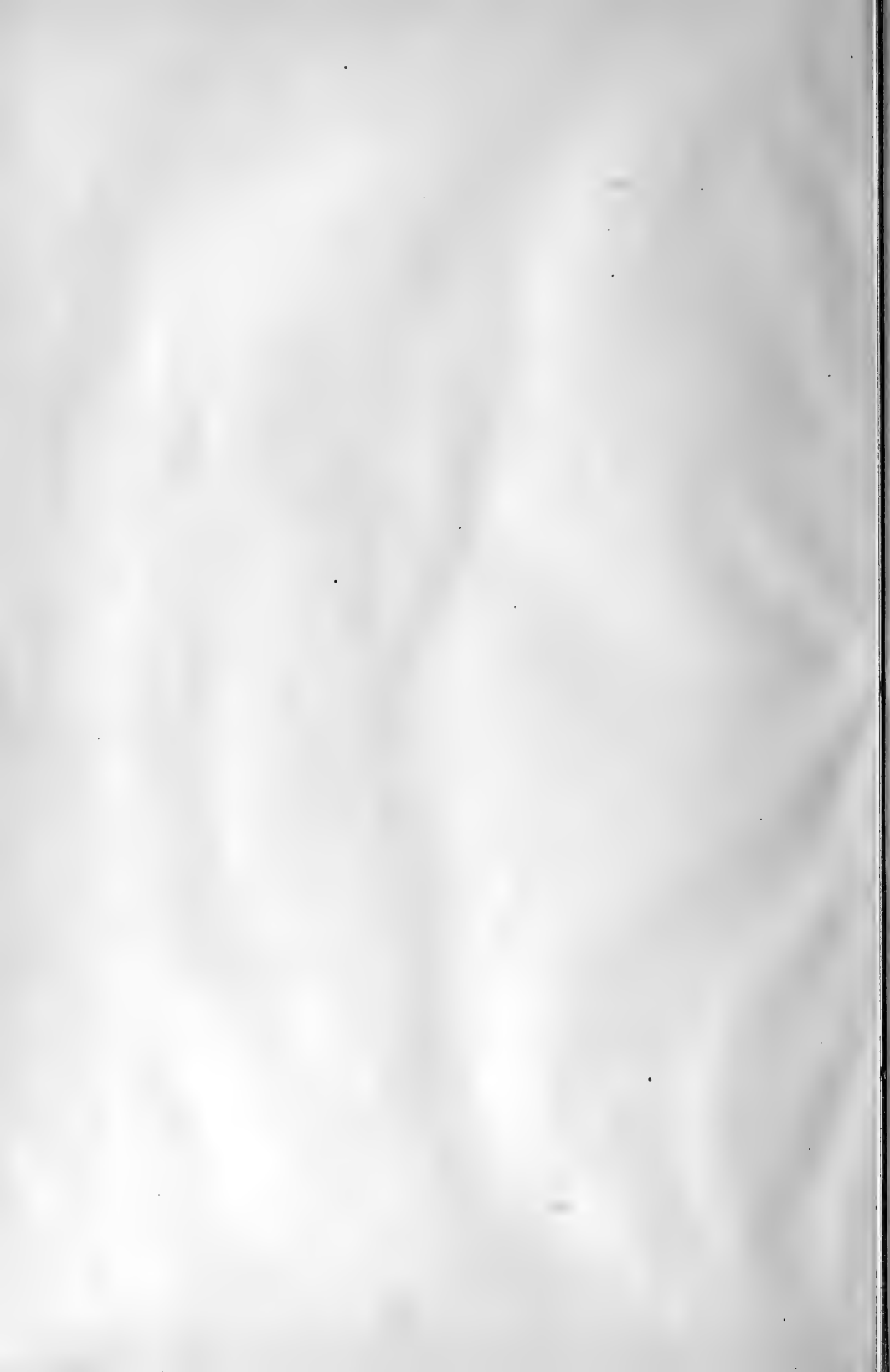
The farmer has the advantage—the great advantage of *position*—he stands at the head. His place is where he can get the greatest blessings of a kind Providence "*at first hands.*"

His position places him next to the great Creator, and where he can receive the blessings of God *direct from his hand.*

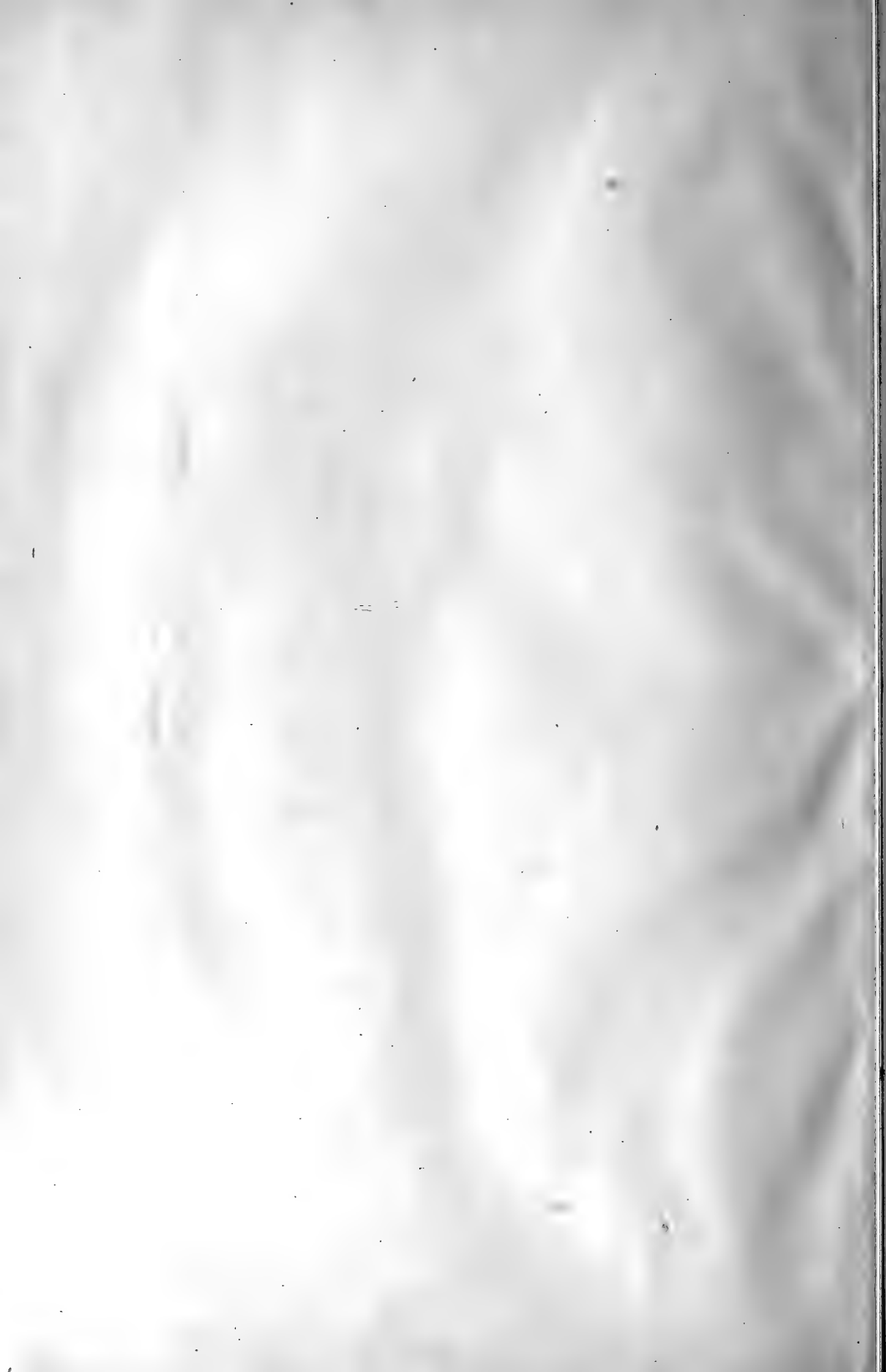
A devout thankfulness should fill his very being for these high and holy privileges conferred, *not upon all*, but only upon him who is at work "*to till the ground.*"



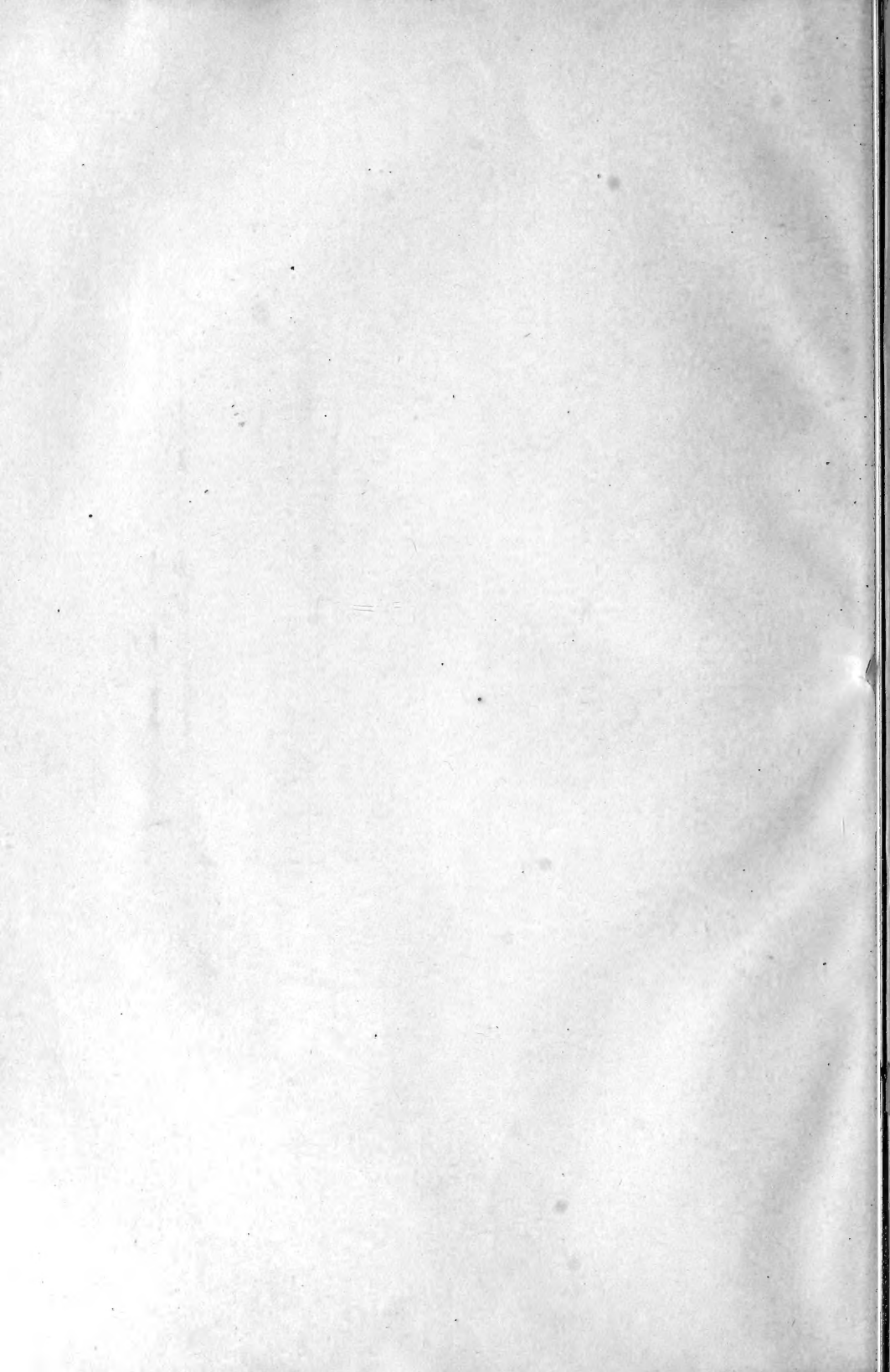


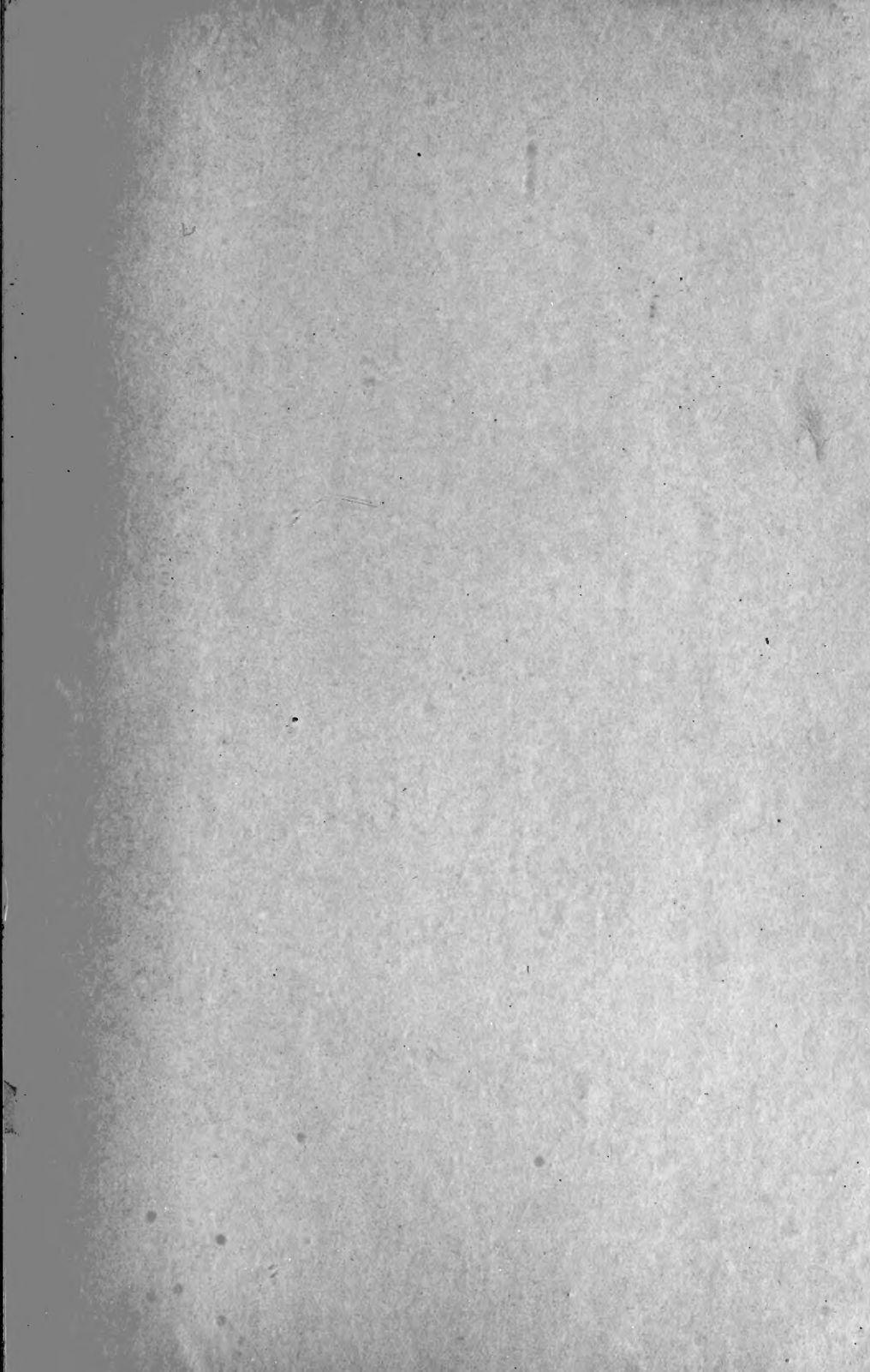












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